REMARKS

Applicant is filing this Preliminary Amendment to ensure that the claims as filed in the national phase filing in the U.S. of PCT application number PCT/FR04/01088 conform to U.S. patent practice. Accordingly, applicant has removed the use of any improper multiple dependent claims and added new claims 28 and 29 in place thereof. Applicant verifies that no new matter has been added by way of this amendment.

Accordingly, applicant respectfully requests that, prior to examination of this application, this Preliminary Amendment be entered in the record.

Prosecution on the merits of claims 1-29 as attached hereto is respectfully solicited.

Respectfully submitted,

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MAILING CERTIFICATE

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as Express Mail in an envelope addressed: Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450, MAIL STOP PCT on November 4, 2005.

Date: Nov. 4, 2005

CLAIMS

1. (Original) Biochip support comprising a substrate supporting at least one porous layer of material on a first face, the said layer being designed to fix biological molecules onto the said layer and in the volume of this layer, the said support being characterized in that the said layer is a thin optical layer of material prepared by the sol-gel method and for which the refraction index is less than the refraction index of the substrate.

2. (Original) Biochip support according to claim 1, characterized in that it also comprises at least one optical layer of material prepared by a sol-gel method supported by a second face of the substrate opposite the first face, the said thin layer supported by the second face having a refraction index lower than the refraction index of the substrate.

3. (Original) Biochip support according to claim 1, characterized in that it comprises a stack of dielectric thin layers forming a Bragg mirror inserted between the substrate and the thin layer of material prepared by the sol-gel method.

4. (Original) Biochip support according to claim 1, characterized in that the substrate is formed from a material chosen from among the group comprising glasses, polymers and semiconductors.

5. (Original) Biochip support according to claim 1, characterized in that the material prepared by the sol-gel method has a purely inorganic composition.

6. (Original) Biochip support according to claim 1, characterized in that the material prepared by the sol-gel method is composed of an inorganic fraction and an organic fraction.

7 (Original). Biochip support according to claim 6, characterized in that the inorganic fraction is larger than the organic fraction.

8. (Original) Biochip support according to claim 6, characterized in that the inorganic fraction confers its cohesion to the sol-gel material.

9. (Currently Amended) Biochip support according to ~~either claim 5 or 6~~ claim 5, characterized in that the said material comprises at least one compound chosen from among:

- an oxide MxOy, where M is chosen from among the group composed of Si, Al, Zr, Ti and Ta,

- an –M-O-M'- type compound, where M and M' are chosen from among the group composed of Si, Al, Zr, Ti and Ta.

10. (Currently Amended) Biochip support according to ~~the previous~~ claim 9, characterized in that when the material prepared by the sol-gel method comprises an –M-O-M'- type compound, M is Si and M' is Zr or Ti.

11. (Original) Biochip support according to claim 6, characterized in that the organic fraction is a polymer, the said polymer remaining free or being weakly bonded to the elements forming the inorganic fraction.

12. (Original) Biochip support according to claim 6, characterized in that the organic fraction is the result of incorporating a silane X-R2-Si(OR1)n into the inorganic fraction.

13. (Currently Amended) Biochip support according to ~~the previous~~ claim 12, characterized in that:

- R1 is chosen from among the group comprising -CH3, -C2H5, nPr, iPr or tBu,

- R2 is an aliphatic chain with length p–CH2, preferably without an ether function –CH2-O-CH2-, where p is between 2 and 10,

- X is a reactive terminal organic group chosen from among the group comprising –OH, -COOH, -CH=O, -NH2, -Cl, -epoxy, -glycidoxy, -CH=CH2, -acryl or –methalcryl.

14. (Original) Biochip support according to claim 1, characterized in that the said thin layer of material prepared by the sol-gel method has pores with size of between 5 nm and 100 nm, and a total porosity of between 1% and 50%.

15. (Original) Process for grafting biological molecules or biomolecules onto and into the thin layer of material prepared by the sol-gel method on the first face of the biochip support according to claim 1, characterized in that it comprises the following steps:

- a sol is prepared that will provide the sol-gel material,

- biomolecules are incorporated into the material during its preparation,

- biomolecules are grafted into the material during its preparation,

- a thin layer of the said sol is deposited on the first face of the substrate,

- the thin layer of sol-gel material is obtained starting from the thin layer of sol.

16. (Currently Amended) Grafting process according to ~~the previous~~ claim 15, characterized in that the biomolecules incorporated into the material during its preparation are silanised biomolecules so that they can be grafted.

17. (Currently Amended) Grafting process according to ~~the previous~~ claim 16, characterized in that biomolecules are incorporated into the said thin layer by diffusion when it is in the form of a dry gel.

18. (Original) Grafting process according to claim 16, characterized in that biomolecules are incorporated into the said thin layer when it is in the form of a wet gel, the biomolecules being grafted while the gel is drying.

19. (Original) Grafting process according to claim 16, characterized in that biomolecules are incorporated to the sol-gel material when it is in the form of sol, biomolecule grafting being made in the sol before deposition of the thin layer in the liquid state.

20. (Original) Grafting process according to claim 15, characterized in that the preparation step of the sol includes a functionalisation step to obtain a functionalised sol-gel material for grafting biomolecules after they have been incorporated in the thin layer.

21. (Currently Amended) Grafting process according to ~~the previous~~ claim 20, characterized in that the biomolecules are incorporated into the thin layer when the thin layer is in the form of a dry gel.

22. (Original) Grafting process according to claim 20, characterized in that the biomolecules are incorporated into the thin layer when the thin layer is in the form of a wet gel.

23. (Original) Grafting process according to claim 20, characterized in that the biomolecules are incorporated in the sol-gel material when the material is in sol form, the biomolecules being grafted in the sol before deposition of the thin layer.

24. (Original) Grafting process according to claim 20, characterized in that the biomolecules are also functionalised, and are then incorporated and grafted in the sol before the sol is deposited in a thin layer.

25. (Original) Grafting process according to claim 15, characterized in that it also comprises a step for structuring the thin layer of sol-gel material to obtain a network of pads or wells over all or part of the biochip support.

26. (Currently Amended) Grafting process according to ~~the previous~~ claim 25, characterized in that the said pads or wells have a characteristic dimension of between 10 and 200 micrometers, and are at a spacing of 50 to 200 micrometers.

27. (Original) Process according to claim 25, characterized in that the network of pads or wells is made using at least one of the techniques chosen from among etching, peeling, micro-machining of the layer of material prepared by the sol-gel

method or by direct deposition of a structured layer of material prepared by the sol-gel method by local micro-distributions.

28. (New) Biochip support according to claim 6, characterized in that the said material comprises at least one compound chosen from among:

- an oxide MxOy, where M is chosen from among the group composed of Si, Al, Zr, Ti and Ta,

- an –M-O-M'- type compound, where M and M' are chosen from among the group composed of Si, Al, Zr, Ti and Ta.

29. (New) Biochip support according to claim 6, characterized in that when the material prepared by the sol-gel method comprises an –M-O-M'- type compound, M is Si and M' is Zr or Ti.